the resemblance between the different groups of reptiles, for instance, is a correspondence of homologous parts, and no evidence of the orders having had an immediate parentage in common. Such a doctrine invites investigation. Here I can but state it, and try to show hereafter in what way such portions of it as practically concern the student of reptile bones may be profitably studied.

IV.—*Proposed Name for the Sponge-animal, viz.* "*Spongozoon*;" *also on the Origin of Thread-cells in the Spongiadæ.* By H. J. Carter, F.R.S. &c.

As it has now been satisfactorily determined that the Spongiadæ are animals and not plants, and the form of the animal which produces them has also been determined, it becomes necessary to give that form a specific name, and to define the animal, in order that henceforth both may not only be used by the zoologist, but by the comparative anatomist, whose lectures without such additions now cannot be considered complete, the time having passed for the comparative anatomist and the botanist to dispute respecting the kingdom to which this class of beings may belong.

The name that I would propose for this purpose is "spongozoon," which is only the Greek rendering of "sponge-animal," but retaining "sponge" for the root will ever ally it to the Spongiadæ, and thus aid the memory by associations which any other term differently compounded would not do.

Spongozoon, or the sponge-animal, then, I first pointed out in *Spongilla*, in 1857 (Annals, vol. xx. p. 28, pl. 1. fig. 4), wherein it is shown that it is a granuliferous polymorphic body possessing a nucleus and one or more contracting vesicles (p. 30), that it exists in communities of a spherical form with a common circular aperture (figs. 2, 3, 5), in countless numbers, in the sarcode of the sponge (fig. 1), and that it is capable of taking into its body crude material and of discharging the undigested portions after the manner of *Amœba*; lastly, that the circular aperture opens and closes itself as required.

Then, in 1859 (Annals, vol. iii. p. 14, pl. 1. fig. 12), the same monociliated body is described and figured with two ear- or spine-like points of its sarcode, one on each side the cilium, which, I might also add, *now* stands in my journal as it was figured "Aug. 12, 1854," although not published until 1859; and that I had been previously acquainted with the existence of the spines may be seen by the following passage in the paper to which I have last referred, viz.:—"But there

is one [monociliated body] in particular, which has two spines or ear-like points projecting backwards, one on each side of the root of the cilium (pl. 1. fig. 12), and this was the kind which I first discovered and described; but, confounding it with cells not possessing these spines (because I then thought the spines might be accidental prolongations of the sarcode), I did not give it this character."

That I might have been right in this conjecture, the polymorphic nature of the whole of this body will presently show.

In June 1866, Prof. James-Clark read a paper before the Boston Natural-History Society "On the Spongiæ ciliatæ as Infusoria flagellata, &c." (Mem. vol. i. pt. 3, reprinted in Annals, Feb. 1868), in which (p. 21, footnote) he conceives that the two spines or ear-like points represent the lines *en profile* of a "membranous cylindrical collar" which he had observed to exist round the cilium of the monociliated cell in *Leucosolenia botryoides*, of which most satisfactory delineations are given in his plate 1. figs. 41–44, together with that of several species, fluviatile and marine, of similar animals that live independently in groups or singly, sessile and pedicelled, respectively, apart from the sponge altogether. In the latter Prof. James-Clark most sagaciously demonstrates the existence also of this "membranous collar"—observations which have been further confirmed as satisfactorily by Mr. Kent's descriptions and delineations of several of the same kind of Infusoria that he found in a pond at Stoke-Newington, in the neighbourhood of London (Monthly Microscop. Journal for Dec. 1871, p. 261, pl. cv.).

Returning, however, to Prof. James-Clark's "footnote," he adds, "that Carter did not always find these 'two spines,' may be explained by the fact that the membranous collar, as I am inclined to believe the 'spines' to be, was retracted, since I have frequently observed this to happen in the case of *Leucosolenia* when it was disturbed."

That is as much as to say that the "collar" is polymorphic; and herein is the explanation of what I have above quoted from my paper of 1859, viz. that "I then thought the spines might be accidental prolongations of the sarcode,"—a fact which is still further confirmed by my paper of 1871 (Annals, vol. viii. pl. 2. figs. 17 & 18), wherein it is not only stated that every part of the sponge-animal is polymorphic, but the "collar" itself in the figures mentioned may be observed to be transformed into two pseudopodial tentaculiform processes for seizing particles of food, like those of an *Actinophrys* or of an *Acineta*.

Hence the "collar" may be cup-like around the base of the

cilium, transformed into pseudopodial prolongations, or, as Prof. James-Clark has stated, "retracted" altogether.

In 1871 (Annals, *l. c.* pl. 1. figs. 15, 16, &c.) I not only confirmed Prof. James-Clark's observations respecting the existence of the "collar," but found that in the spongozoon of *Grantia compressa* it was supported on a neck-like projection, to which I gave the name of "rostrum." Moreover it was also proved, by the use of indigo-solution, that the spongozoa of this sponge took in crude particles of this substance, while similar monociliated bodies similarly grouped were also observed in the marine siliceous sponges; to which I can add one of the horny species *par excellence*, viz. an *Aplysina* (Nardo & Schmidt), now belonging to the British Museum, but which Mr. Kent lately found while dredging for sponges on board the yacht 'Norna,' in Vigo Bay.

Thus having found spongozoa in all the three divisions of the Spongiadæ, viz. in the Keratospongiæ, the Siliceospongiæ, and the Calcispongiæ, similar in form and similarly grouped, we may reasonably infer that the spongozoon exists as such, perhaps more or less modified, throughout the whole of the Spongiadæ, and therefore is *the* animal which constructs the sponges generally.

In Silliman's Journal for Dec. 1871 (reprinted in Annals, vol. ix. p. 71, pl. 11) Prof. James-Clark confirms, so far as his observations go, the principal points of my description and figures of the "Ultimate Structure of *Spongilla*," given in the 'Annals' of 1857 (*l. c.*), to which I have alluded in the first part of this communication.

But at p. 76 (Annals, *l. c.*), where Prof. James-Clark states that the groups of "monad cephalids" (our spongozoa) are "not cells; they are the *heads* of a polycephalic individual, and consequently correspond functionally to the tentaculated heads of polypi," I cannot agree with him, inasmuch as they appear to me to be much more analogous to the groups of Ascidians in the gelatinous structure of a Compound Tunicated animal, where the little colony is divided up into groups, furnished respectively with a common cloacal orifice (Annals, vol. viii. pl. 2. fig. 41). Here I might add that some of Schmidt's Halisarcinæ are so like the Compound Tunicata, that his *H. guttula* appears to me to be one of the latter, and no sponge at all. I speak, of course, from the actual examination of his specimen in spirit at the British Museum in connexion with his published description.

Further, Prof. James-Clark does not admit the existence of a *distinct* cell round the groups of spongozoa, as I originally described and figured them as a whole under the name of

"ampullaceous sac" (Annals, 1857, *l. c.*), but that the groups are situated in excavations of what I termed, in 1849, the "intercellular substance" (that is, in "mere cavities," having "no lining wall," Annals, 1872, *l. c.* p. 76), but opening into the chamber which I have delineated between the "investing membrane" and the "parenchyma" (fig. 1, 1857, *l. c.*), Professor James-Clark's "cytoblastemic mass."

All that I can state in reply to this is, that I have figured faithfully (*l. c.*) what appeared to me to be the rim of a circular opening in material belonging to the spherical group of spongozoa. Furthermore, in my journal, under date "26th March 1857," stands a figure of one of these spherical groups of spongozoa which I well remember to have observed in the watch-glass *by itself*, with the cilia still vibrating in its interior and the aperture closed, after that state had arrived when, as I have described (p. 29, *l. c.*), the whole of the soft parts of the young *Spongilla*, apparently from starvation, leave the spicular structure and become dispersed about the watch-glass.

That I did not figure this cell I also well remember to have arisen from diffidence on account of the great number of new and startling facts that were then revealed to me.

Of this being fact, I now have no longer any doubt; and thus we had an "ampullaceous sac" entirely isolated from the parenchyma ("cytoblastemic mass," Prof. James-Clark) of the sponge, that is, by itself in the watch-glass.

With no aperture, it is true; but then we know that this can be closed or opened as required: yet it still retained the globular form; and hence the question then comes, whether this globular form was retained by an intercellular substance or sarcode uniting the spongozoa together, or whether this union arose from an amalgamation of the polymorphic sarcode of which their bodies are respectively composed. I incline to the former; and this is what I should designate as the "ampullaceous sac."

But here we arrive at a point which is most perplexing, if it be not almost entirely beyond our powers to decide,—viz. that state in which the living material assumes forms so delicate and so fugitive that we are inclined to deny to them characters even in a remote degree of that solidity and permanence which by comparative coarseness becomes so evident to our senses in the more advanced developments of ordinary tissues.

In short, are we to deny the existence of a cell of intercellular substance binding the whole of the spongozoa into a spherical community, or not? And if so, where is the proof

that this spherical form is maintained by the spongozoa uniting together without the intervention of this substance?

This brings me to another point which I wish particularly here to clear up.

In Prof. James-Clark's footnote (Annals, Jan. 1872, p. 76) it is stated that "he [Carter] has since (viz. in the Annals of 1859, *l. c.*) revoked that view and adopted another. We believe him to be, excepting the inferred 'ampullaceous sac,' in the main right in his first interpretation"—that is, of 1857.

Had Prof. James-Clark chanced to have looked on to my "Notes and Corrections" (Annals, 1861, vol. viii. p. 290), two years afterwards, he would there have seen that which he himself has stated, viz. that I myself *then* felt right in my interpretations of 1857.

Time and subsequent observation have explained how all this revoking occurred. The whole has arisen from the polymorphic ever-changing nature of the soft parts of the sponge. What I saw at first was changed upon my second observations; and I saw in the third set again what I had proclaimed in the first and denied in the second. In the higher developments there is no dispute as to the nature of structures, because they are permanent and evident; but in the ever-changing sarcode phenomena are exhibited which certainly, in our present state of knowledge, are inexplicable; and the very difference of opinion respecting them to which I have above alluded proves at once that we have as yet no certain data to go upon for any assertions respecting them. What is a mass of sarcode at one moment may be at another in the form of a membrane so delicate as almost to be inappreciable by our senses, and at a third reappear in the form of pseudopodial prolongations. Nay, in *Æthalium* the sarcode may be seen to divide into separate portions and reunite into one mass, apparently as intimately as drops of water.

Finally, I have to describe Spongozoon.

It may be defined to be a spherical polymorphic body or cell, bearing on one part of its circumference an oblong cylindrical neck-like process, called the rostrum, which supports a delicate cup-like collar, from the centre of which proceeds a long cilium. Internally it contains granular plasma, in which are imbedded a nucleus and one or more contracting vesicles. It possesses the power of taking in crude material for food, and exists in spherical or globular communities imbedded in countless numbers in the sarcodal lining of the areolar cavities of the sponge. Each of these spherical communities is provided with a circular contractile opening on the surface, through which the particles of food enter, to be further taken

in by the monociliated bodies which, in juxtaposition, line the interior and, projecting their cilia inwards, keep up a rapid undulating vibration towards the centre of this hollow sphere. The undigested parts of their food may be seen to pass into the excretory canals, and, through them, to be finally ejected at the vents on the surface; but whether it passes through their bodies after the manner of *Amœba*, or has a distinct channel appropriated for this purpose, has yet to be determined.

Parasitic Polypes and Thread-cells in the Parenchyma of a Sponge.

In a specimen, about two inches long, of a thick digito-lobulate branched *Reniera*, tubulate, opening by a large vent at the end of each lobe, and having one form of spicule only, viz. thin, curved, acerate, said to be of a "pale red colour when alive," and found in "Bon Bay," in "25–65 faths.," just sent to me by Prof. Wyville Thomson, I have found the parenchyma interiorly to be charged with thread-cells of an ovoid form, almost elliptical, and averaging 3-6000ths of an inch long by 2-6000ths of an inch broad—in short, very similar to, if not exactly like, that delineated by Dr. T. Eimer (Schultze's Archiv für mikroscop. Anatom. vol. iii. pt. 2, fig. 1, A, p. 283).

Not having found these cells in the dermal part of this sponge, nor in the surface-layer of the great tubular vents, analogous to their position in the polypes &c., but, on the contrary, in the interior of the parenchymatous structure of the sponge, I began to think that they could not belong to it; so I placed a portion in water and examined it with one-inch focus, when they were observed to come from minute delicate polypes, seated in dilated cavities, apparently of the excretory canals, the disk or head of each polype averaging 100th of an inch in diameter, and supported on a short neck, which ended in a little saccular prolongation that was sunk into the parenchyma or sarcode of the sponge, and charged, in its walls as well as tentacles, with thread-cells so numerous that they appeared to exceed in bulk the rest of the polype, as may be seen by picking out one on the point of a needle, and putting it under a higher power.

This is the first instance, I think, in which a parasitic polype has been discovered in the *interior* of the substance of a sponge; and when it is remembered that a microscopic power with delicate manipulation under water is required for their detection, it may perhaps be assumed that this is how these polypes escaped Dr. Eimer's notice, and may also explain

how he found thread-cells in *Reniera fibulata* and *Desmacella vagabunda*, seeing that many thousands of microscopical examinations of the Spongiadæ have been made by different naturalists up to this time without their observation.

The Renierinæ are especially subject to surface polype parasites, and none more so, perhaps, than *Reniera fibulata*, Sdt., all over the world. (This species is characterized by two forms of spicules, viz. (1) acerate, curved, smooth, large, and (2) C- & S-shaped, minute.) But I have never before found a parasitic polype in the interior of a *Reniera* or any other sponge, and never any thread-cells where there were no parasitic polypes to originate them. Nor should I have been able to detect them now but for the process mentioned.

There is also another jar sent me by Prof. W. Thomson, in which there is a portion of the same sponge with three other small fragments of as many species undescribed; but this is labelled "Adventure Bank, 92 faths."

"Bon Bay" is on the African coast, opposite Cape Spartivento (Sardinia); and "Adventure Bank" is the shoal between Tunis and Sicily.

Prof. Thomson also adds the following interesting information respecting thread-cells, in a note just received:—

"Thread-cells are abundant in every thing which feeds upon Cœlenterates of any kind, young or mature, whether feeding by cilia or by the mouth. I have found the thread-cells of several Hydroids apparently living in the skin of a *Synapta*; and you can always find plenty of them in *Amphidetus*. Of course, if you find a parasitic polype in the sponge, there is no further difficulty; but that does not seem necessary. Thread-cells appear to be able to live, for a time at least, an independent life in foreign quarters."

June 17, 1872.

V.—*On my so-called* Globiocephalus Grayi.

By Dr. Hermann Burmeister.

In the new 'Journal de Zoologie,' the editor, Prof. Paul Gervais, of Paris, has noticed (tome i. p. 68) the descriptions of Cetacea published by myself in the 'Anales del Museo Público de Buenos Aires,' tome i. p. 367 *et seqq.*, and has hinted, with good reason, that the animal described there as *Globiocephalus Grayi* is not a *Globiocephalus*, but a *Pseudorca*, nearly allied to, if not identical with, *Ps. crassidens* of Prof. Reinhardt (Overs. Kongl. Danske Vidensk. Selsk. Forhandl. 1862, p. 103 *et seqq.*), comparing my figures given on pl. 21 of the 'Anales'